Year 9 Big Picture – Computer Science

Autumn 01 Weeks 1 – 7 (7 weeks)	Autumn 02 Weeks 8 – 14 (7 weeks)
Unit 9.1: Cyber Security This unit takes the learners on an eye-opening journey of discovery about techniques used by cybercriminals to steal data, disrupt systems, and infiltrate networks. The learners will start by considering the value of their data to organisations and what they might use it for. They will then look at social engineering techniques used by cybercriminals to try to trick users into giving away their personal data. The unit will look at the more common cybercrimes such as hacking, DDoS attacks, and malware, as well as looking at methods to protect ourselves and our networks against these attacks.	**Unit 9.2: Networks Advanced** This unit begins by defining a network and addressing the benefits of networking, before covering how data is transmitted across networks using protocols. The types of hardware required are explained, as is wired and wireless data transmission. Learners will develop an understanding of the terms 'internet' and 'World Wide Web', and of the key services and protocols used.
Content **KNOWLEDGE** - Explain the difference between data and information - Identify what happens to data entered online - Explain the need for the Data Protection Act - Recognise how human errors pose security risks to data - Define hacking in the context of cyber security - Explain how a DDoS attack can impact users of online services - Explain the need for the Computer Misuse Act - List the common malware threats - Examine how different types of malware causes problems for computer systems - Explain how networks can be protected from common security threats - Identify the most effective methods to prevent cyberattacks **SKILLS: Comparison/Analysis** - Implement strategies to minimise the risk of data being compromised through human error	**Content** **KNOWLEDGE** - Define what a computer network is and explain how data is transmitted between computers across networks - Define 'protocol' and provide examples of non-networking protocols - Define 'bandwidth', using the appropriate units for measuring the rate at which data is transmitted, and discuss familiar examples where bandwidth is important - Define what the internet is - Explain how data travels between computers across the internet - Describe key words such as 'protocols', 'packets', and 'addressing' - Explain the difference between the internet, its services, and the World Wide Web - Describe how services are provided over the internet - List some of these services and the context in which they are used

• Identify strategies to reduce the chance of a brute force attack being successful • Question how malicious bots can have an impact on societal issues • Compare security threats against probability and the potential impact to organisations	• Explain the term 'connectivity' as the capacity for connected devices ('Internet of Things') to collect and share information about me with or without my knowledge (including microphones, cameras, and geolocation) • Describe how internet-connected devices can affect me SKILLS: Identify and compare key Hardware needed • List examples of the hardware necessary for connecting devices to networks • Compare wired to wireless connections and list examples of specific technologies currently used to implement such connections
Mini Test – MCQ Cyber Security	**Mini Test Week: MCQ Networks** **Revise for Big Test 1 in Spr 1: Various Questions on Cyber Security & Networks**

Spring 01 *Weeks 15-21(6 weeks)*	*Spring 02* *Weeks 22-26 (Spring 02) – …. (5… weeks)*
Unit 9.3: Planning Interactive Media Products In this unit, learners will first develop pre-production skills used in the digital media industries. They will learn the importance of understanding the client's requirements, planning, developing timeframes and deadlines, and the techniques involved in these processes **Students will be introduced to Vocational Assessment**	**Unit 9.4:Creating Imedia Products: Image/Video** Learners will develop their learning from last term and progress to learn about a number of the different software tools used within this sector, and learn how to use them to fulfil basic client briefs. Learners will then apply this knowledge and develop their own digital media creation from a set of provided briefs. They will present their creation to the group and assess each other's projects in terms of their effectiveness at meeting the aims of the brief.

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KNOWLEDGE

- Describe the term 'pre-production'
- Compare planning tools available for pre-production
- Name associated file formats for types of digital graphics
- Identify the resources required for creating digital graphics
- Recognise the legislation regarding use of digital graphics
- Discuss the features and properties of websites

SKILLS

- Create pre-production planning materials
- Plan a multi-page website
- Plan a digital media artefact from a selected client brief
- Evaluate design decisions for media artefacts

Assessment:

Wk 17-20 Big Test 1 in Spr 1: Various Questions on Cyber Security, Networks & Interactive Media

Mini Test: Interactive Media Products Processes

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KNOWLEDGE

- Describe the two main types of digital graphics: raster and vector
- Name the different camera angles used in video production
- Recognise different file formats and properties of digital video

SKILLS

- Utilise open source software to create both types of digital graphics
- Utilise the software required for digital video creation
- Create a multi-page website using open source tools
- Create media artefacts

Mini Test: Interactive Media Products Techniques

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Summer 01 Weeks 27–32 (6 weeks)	Summer 02 Weeks 33 -39 (7 weeks)
Unit 9.5: HTML and CSS Media Products *CP8.4 Use at least one additional programming language (that must be textual) to solve problems* The aim of this topic is to extend the students' knowledge of HTML coding skills. Students will learn about how webpages are created using HTML.	**Unit 9.6: Data Science** In this unit, learners will be introduced to data science, and by the end of the unit they will be empowered by knowing how to use data to investigate problems and make changes to the world around them. Learners will be exposed to both global and local data sets and gain an

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Students will extend their skills in HTML and will learn how to change the appearance of web pages using CSS.	understanding of how visualising data can help with the process of identifying patterns and trends. Towards the end of the unit, the learners will go through the steps of the investigative cycle to try to solve a problem in the school using data.

KNOWLEDGE:
- Describe what HTML is
- Identify and explain the features of a website
- Know the basics of good Web Design
- Understand the purpose of CSS and why it is needed in addition to HTML
- Understand the purpose of DIV tags
- Know the impact of search technologies and the issues that arise by the way they function and the way they are used

SKILLS:
- Use HTML to structure static web pages
- Modify HTML tags using inline styling to improve the appearance of web pages
- Display images within a web page
- Create Hyperlinks between pages
- Experiment with CSS by changing the style of the tags learnt so far
- Create hyperlinks to allow users to navigate between multiple web pages
- Create a three-page website to showcase the skills learnt throughout this unit of study
- Self/peer evaluate the produced webpage using a rubric

KNOWLEDGE:
- **Define data science**
- **Explain how visualising data can help identify patterns and trends in order to help us gain insights**
- **Evaluate findings to support arguments for or against a prediction**
- **Define the terms 'correlation' and 'outliers' in relation to data trends**
- **Identify the steps of the investigative cycle**
- **Identify the steps of the investigative cycle**
- **Identify the data needed to answer a question defined by the learner**
- **Describe the need for data cleansing**
- **Visualise a data set**

Skills
- **Use an appropriate software**
- **tool to visualise data sets and r**ecognise examples of where large data sets are used in daily life
- Select criteria and use data set to investigate predictions
- Solve a problem by implementing steps of the investigative cycle on a data set
- Use findings to support a recommendation
- Create a data capture form
- Apply data cleansing techniques to a data set
- Analyse visualisations to identify patterns, trends, and outliers
- Draw conclusions and report finding

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	Assessment: Wk 35-36 Big Test 2 in Sum 2: Various Questions on Cyber Security, Networks & Interactive Media, HTML, & Data Representation